

Remarks/Arguments:

Favorable reconsideration of this application, in light of the present amendments and following discussion, is respectfully requested.

Claims 1-3 and 7-20 are pending; Claims 4-6 are cancelled; and Claims 1-3 are amended. It is respectfully submitted that no new matter is added by this amendment, as this amendment corrects minor typographical errors.

Applicant acknowledges with appreciation the indication that Claims 10-15, 19 and 20 contain allowable subject matter. However, because the only amendments correct typographical errors, these claims have not been amended to be in independent form.

Regarding the objection to Claims 1-20, it is respectfully requested that this objection be withdrawn, as Claim 1, 2, and 3 have been amended to remove the noted informalities.

As for the objection to Claims 4-6 under 37 C.F.R. § 1.75(c), Claims 4-6 have been cancelled herewith, thereby rendering this objection moot.

With regard to the rejection of Claims 1 and 4 under 35 U.S.C. § 103(a) as unpatentable over Takeuchi (JP 406286169A) in view of Yoshida et al. (JP 404158050A, hereafter Yoshida), that rejection is respectfully traversed. Claim 1, as amended, recites that the armature, when rocking to the standby position, collides against the hard plate.

In a wire dot printer head, when the armature rocks to the printing position, an end of the wire collides against a print sheet, and printing is thereby performed. Generally, this wire dot printer has an armature stopper, with which the armature comes into contact when rocking from the printing position to the standby position. The armature stopper absorbs a shock caused by the rocking of the armature to the standby position, suppresses a rebound of the armature, and prevents occurrence of overstriking or poor ribbon feeding as a result of the rebound.

However, in recent years, printing speed and pressure have increased, and the impact of collision between the armature stopper and the armature rocking to the standby position has increased. As a result of these repeated impacts from collisions between the armature and the armature stopper, a part of the stainless plate colliding against the armature is cut away, broken, or may become deformed. If the part colliding against the armature wears, becomes broken, or becomes deformed, the printing stroke of the armature changes, and variation occurs in printing timing and printing pressure in each wire. As a result, printing quality is degraded.

Additionally, if the shock of the collision between the armature and the armature stopper increases, the plate vibrates due to the shock, and the vibration of the plate is transmitted to other armatures in the printer. In the armatures receiving the vibration transmission, variation occurs in rocking timing with respect to printing position and printing pressure, and printing quality is also degraded.¹

In light of the above-described difficulties, the Applicant developed the present invention as recited in Claims 1, 2, and 3. As noted above, Claim 1 recites that the armature, when rocking to the standby position, collides against the hard plate. Additionally, Claim 1 recites that the hard plate is made of surface-hardened titanium, thereby improving abrasion resistance.

Takeuchi describes that an armature stopper 21 includes a polyimide resin film 21a, a hard plate 21b, and an elastic plate 21c.² Takeuchi also describes that the armature 26 does not directly touch the hard plate 21b, as the polyimide resin film 21a is interposed between the armature 26 and the hard plate 21b. In fact, the polyimide resin film 21a of Takeuchi is formed on the surface of the hard plate 21b. As the armature 26 of Takeuchi rocks back and

¹ Specification, pages 1-2.

² Takeuchi, col. 5, lines 11-16.

forth between a printing and standby position, the polyimide resin film 21a is damaged in a matter of minutes by the armature 26 rocking back and forth. As a result, print quality in Takeuchi is not stable and deteriorates over time.

Takeuchi also describes that the hard plate 21b is made of stainless steel, and Yoshida describes that a stopper 2 is made of titanium alloy. However, when the hard plate 21b is made of stainless steel and the stopper 2 is made of titanium alloy, abrasion resistance decreases. For this reason, Claim 1 recites that the hard plate is made of surface-hardened titanium, thereby improving abrasion resistance.

Accordingly, as both Takeuchi and Yoshida fail to disclose or suggest the limitations recited in Claim 1, it is respectfully submitted that Claim 1 patentably distinguishes over both Takeuchi and Yoshida. It is therefore respectfully requested that this rejection be withdrawn.

Moreover, it is respectfully submitted that there is no basis in the teachings of either Takeuchi or Yoshida to support the applied combination. Certainly, the Office Action fails to cite to any specific teachings within either of Yoshida or Takeuchi to support this combination. It is therefore respectfully submitted that the combination of Takeuchi and Yoshida is based upon hindsight reconstruction, and is impermissible.

With regard to the rejection of Claims 2, 3, 5, 6, 16, and 17 under 35 U.S.C. § 103(a) as unpatentable over Takeuchi, that rejection is respectfully traversed.

Claims 5 and 6 have been cancelled, thereby rendering their rejection moot. Independent Claims 2 and 3, similarly to Claim 1, recite that the armature, when rocking to the standby position, collides against the hard plate. As noted above, Takeuchi fails to disclose or suggest this feature.

Additionally, Claim 2 recites that the hard plate is made of precipitation-hardened SUS 631 and Claim 3 recites that the hard plate is made of maraging steel, neither of which

are suggested by Takeuchi. However, through the claimed configuration, it is possible to improve the abrasion resistance of the hard plate.

As Takeuchi fails to disclose or suggest the limitations recited in Claims 2 and 3, Applicant respectfully submits that Claims 2, 3, 16, and 17 patentably distinguish over Takeuchi. It is therefore respectfully requested that this rejection be withdrawn.

Regarding the rejection of Claim 7 under 35 U.S.C. § 103(a) as unpatentable over Takeuchi in view of Yoshida, and further in view of Sanders, Jr. et al. (U.S. Pat. No. 4,552,064, hereafter Sanders), that rejection is also traversed.

Claim 7 depends from Claim 1. As noted above, neither Takeuchi nor Yoshida discloses or suggests that the armature rocks against the hard plate, as recited in Claim 1. It is respectfully submitted that Sanders fails to remedy the defects above-noted with regard to Takeuchi and Yoshida.

Sanders relates to dot matrix printers and print heads therefor. Sanders describes that damper mechanisms are provided for absorbing recoil such that refire rates of 350 micro-seconds or less are achieved.³ However, Sanders does not disclose or suggest that the hard plate is provided in a position and direction in which the armature, when rocking to the standby position, collides against the hard plate.

Accordingly, as none of Takeuchi, Yoshida, or Sanders disclose or suggest the limitations recited in Claim 1, from which Claim 7 depends, it is respectfully submitted that Claim 7 patentably distinguishes over the applied combination of Takeuchi, Yoshida, and Sanders. It is therefore respectfully requested that this rejection be withdrawn.

Furthermore, it is respectfully submitted that there is no basis in the teachings of any of Takeuchi, Yoshida, or Sanders to support the applied combination. Again, the Office

³ Sanders, Abstract.

Action fails to cite to any specific teachings in any of Takeuchi, Yoshida, or Sanders to support this combination. It is therefore respectfully submitted that the applied combination of Takeuchi, Yoshida, and Sanders is based upon hindsight reconstruction, and is impermissible.

With regard to the rejection of Claims 8, 9, and 18 under 35 U.S.C. § 103(a) as unpatentable over Takeuchi and further in view of Sanders, that rejection is respectfully traversed. Claims 8 and 18 depend from Claim 2, and Claim 9 depends from Claim 3.

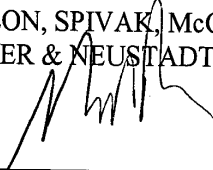
As noted above, Takeuchi and Sanders both fail to disclose or suggest that the armature, when rocking to the standby position, collides against the hard plate. Accordingly, it is respectfully submitted that Claims 8, 9, and 18 patentably distinguish over the applied combination of Takeuchi and Sanders for the reasons set forth with regard to Claims 2 and 3. It is therefore respectfully requested that this rejection be withdrawn.

Moreover, it is respectfully submitted that there is no basis in the teachings of either Takeuchi or Sanders to support the applied combination, and the Office Action fails to cite to any specific teachings within either Takeuchi or Sanders to support this combination. It is therefore respectfully submitted that the applied combination of Takeuchi and Sanders is based upon hindsight reconstruction, and is improper.

Consequently, in view of the foregoing discussion and present amendments, it is respectfully submitted that this application is in condition for allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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